

Syllabus  
Software Risk Management  
(N ECTS)

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## I. Course Description

### Pre-requisites:

The course ‘Software Risk Management’ is offered to the students of the Master’s Program «System and Software Engineering (SSE)». It is presupposed that all individuals accepted as Master Program students completed corresponding full-time Bachelor degree training programs and were selected (based on the portfolio tenders, or other core performance indices) to continue their MS education in the Program, therefore the students should be familiar with the basics of the following training courses: a) Object-oriented analysis and programming b) The software testing methodology.

The students will learn how to use the appropriate standards and methodologies, analyze uncertainties, identify potential risks using specific tools and methodologies, conduct assessment and evaluation of risk impact and probability, make the appropriate selection of risk response actions, conduct management actions and provide quality reporting on risk management process of software development during its life cycle.

The Risk Management course explains the discipline’s core principle and how they can be applied in an IT operations environment.

### Abstract

The training course ‘Software Risk management’ is concerned with theories, methods and tools for professional risk management during software development process. It is based on the training and research materials of Software Engineering Institute (SEI), Guide to Software Engineering by IEEE (SWEBOK), PMBOK study by Project Management Institute (PMI), Microsoft Solution Framework (MSF) - Risk Management discipline for operations, which contains important background information for risk management usage in IT operations and process environment.

Modern risk management concerns all aspects of software development: quality, team members, requirements and specification, contractors and 3<sup>rd</sup> parties, cost, resources. To be effective, team members need to understand the activities performed at each stage in the development cycle and apply appropriate risk management activities. In this course, students analyze, design, implement risk management tools and techniques that meet the software development objective through a simulated case study. They gain hands-on experience performing each role within the risk management process using all the core concepts and skills necessary to engineer and maintain a successful program with limited and predictable risks.

Software development and technology projects continue to challenge IT – many projects are unsuccessful or squander precisions resources through poor quality results as a consequence of lack of risk management procedures.

The course knowledge is applicable in nearly all software development and IT organizations and examples illustrate situations familiar to e-businesses, service providers, dot com and information technology companies.

Initially the course is aimed at students taking undergraduate and graduate courses and at software engineers in commerce and industry. It may be used in general software engineering courses or in courses such as advanced programming, software specification, and software design or management.

Also the course is based on the “Analysis and mitigation of risks in complex software programs” book and materials developed by Professor V.V. Lipaev and implemented into SU-HSE being a part of an innovative educational program.

The course is compliant with ISO standards and CMM/CMMI standards for industrial software development. The training materials follow the Software Engineering Education Knowledge (SEEK) knowledge insights, described in Software Engineering paper book.

The training structure meets the requirements of Russian and international standards of software development and the global professional standard ‘Guide to the Software Engineering

Body of Knowledge (SWEBOK) ISO/IEC TR 19759 IEEE’.

The course is aimed at studying the major current approaches to risk management in software engineering processes: identification, analysis and assessment, response planning, monitoring and control. It describes the methods, platforms, technologies and tools, which are applied for all stages of life cycle and covers software risk management at each stage.

## **II. Learning Objectives**

The main objective of the training course is to examine and discuss with students fundamentals and principles of Risk Management (RM) during software development projects, get familiar with common methods and standards of RM, development and evolution of complex risk assessment and evaluation techniques, analyze trends in available risk management software based on its functionality .

During the two-module course “Software Risk Management”, the students will:

- Study the place and role of risk management in software engineering development process, place it in a broader systems context and present the concept of risk management processes and management.
- Get familiar with available standards and methodologies for risk management of software development projects
- Learn the processes, techniques and deliverables that are associated with risk identification, assessment, response planning and control.
- Acquire skills in software risk management across the software development and maintenance life cycle.
- Get familiar with main risk identification techniques: brainstorming, fishbone, Delphi, SWOT analysis, Crawford cards, etc.
- Focus on techniques for risk assessment: scenario analysis, Decision Tree analysis, modeling techniques such as Monte-Carlo simulation, etc.
- Update and improve the quality of the risk management guidance and examples, applicable to software engineering area.
- Discover the importance of management topics in software engineering risk management: managing people risks, cost risks, quality risks, process improvement risks configuration risks, technology risks, etc.
- Provide more explicit guidance regarding the responsibility and accountability of risk management activities in IT operations
- Clarify the business value that can be realized by creating a risk management culture and adopting best practices.

### III. Learning Outcomes

The course is aimed to help students to develop skills that will enable them to construct quality software in time, within scope and fit to specification, and that is reasonably easy to understand, modify and maintain.

At the end of the course the students will acquire theoretical and practical knowledge and will be able to use:

Technical skills

1. Define risk management and explain its importance
2. Discuss the concepts of risk management methodologies and risk management processes
3. Develop and write a risk management plan
4. Develop and write a risk management Specification / Register
5. Distinguish and be able to choose appropriate risk management technique
6. Understand the specifics of software development and IT area and build IT risk classification
7. Conduct a risk management identification and review
8. Implement risk management tools according to the software development life cycle
9. Document the outputs of risk management process
10. Explain the importance of risk assessment and evaluation
11. Document risk identification and assessment results
12. Choose appropriate risk response action
13. Conduct risk monitoring and control procedure
14. Define qualities and characteristics for risk manager's role
15. Understand the communication lines during the risk management process
16. Conduct risk audit analysis and provide report
17. Get familiar with main common risk categories and risks (technical, organizational, financial, contractors, etc.) that are specific for software development and maintenance process
18. Define CASE tools and risk management environments
19. Get familiar with existing risk management software
20. Prepare the final report for the course

Soft skills

1. Work within a team and understand team dynamics
2. Be able to effectively communicate their work (Presentation skills)
3. Be able to write a project report (report writing skills)
4. Be able to reflect on their own work as well as the work of others (evaluate their experience)

### IV. Course Plan

Topic Name	Course Hours, Total	Audience Hours		Self Study, and Exam
		Lectures	Practical Studies	
<b>Module 1</b>				

1	<b>Risk management fundamentals. Specifics of IT industry and projects</b>	7	2	3	2
2	<b>Overview of the main standards and methodologies on RM: MSF, RUP, XP, PMBoK</b>	7	2	3	2
3	<b>Key success factors and problem areas in IT</b>	7	2	3	2
4	<b>Key risk factors: quality improvement and requirements tracking</b>	7	2	3	2
5	<b>Risk Taxonomy/ classification. Risk factors</b>	7	2	3	2
6	<b>Risk management process: Identification</b>	7	2	3	2
7	<b>Risk management process: Qualitative assessment</b>	7	2	3	2
	<b>Module 1, totally:</b>	49	14	21	14
<b>Module 2</b>					
8	<b>Risk management process: Quantitative assessment and modeling</b>	7	2	3	2
9	<b>Risk management process: risk response and control</b>	7	2	3	2
10	<b>Risks in IT outsourcing</b>	7	2	3	2
11	<b>Risks and information security</b>	7	2	3	2
12	<b>Organization of risk management. Team management</b>	7	2	3	2
13	<b>IT Risk management Audit</b>	7	2	3	2
14	<b>Software Tools in risk management</b>	7	2	3	2

	Preparation for final exam, course review and Q&A session	22	8	2	12
	<b>Module 2, totally:</b>	71	22	23	26
	<b>TOTAL:</b>	<b>120</b>	<b>36</b>	<b>44</b>	<b>40</b>

**Topic 1. Risk management fundamentals. Specifics of IT industry and projects.**

Vocabulary, Why do we manage risks nowadays? Characteristics of Risk, Definition of RISK. Positive risks and negative risks, IT project specifics. Software projects risk failure, Lifecycle Planning and risk management.

**Topic 2. Overview of the main standards and methodologies on RM: MSF, RUP, XP, PMBoK.**

The need of methodology. Risk management as an integrated element of modern management. Problems with applying methodology benchmarking and best practices. CMMI Maturity Levels and Risk Management in the CMMI. Risk Management Principles

**Topic 3. Key success factors and problem areas in IT.**

The Triple Constraint framework. Risks associated with changes. Change management – guidance to avoid risks. What is the reason for IT project ? Difference between Buyer and end users. TOP-10 Implementation Failures. Information Technology Success Potential Scoring Sheet

**Topic 4. Key risk factors: quality improvement and requirements tracking.**

The quality in Software Engineering. Measures of Information System Input & Output. Total Quality Management key principles. Key CMMI principles. 6 SIGMA for eliminating defects (statistic measurement of quality). Quality management by the leading software developers. Techniques for Defining Stable Requirements.

**Topic 5. Risk Taxonomy/ classification. Risk factors.**

Classification approach. SEI Risk Taxonomy and classification of software risks. Classification by core knowledge areas and by quality metrics. Sample Risk Breakdown Structure. Risk dependency, risk factors / sources of risks. Sources of software risk (systems context). The questions to identify potential risk. Cause-effect risk structure. Risk statement, risk owners, examples of Risks for software development.

**Topic 6. Risk management process: Identification**

Introduction to the main risk processes stages. Stage 1: Risk management planning and topics addressed in a risk management plan. Risk Tolerance / Appetite. Contingency and Fallback Plans, Reserves. Stage 2: Risk Identification guidance. Tools and techniques for risk identification. Definition of risk attributes or characteristics.

**Topic 7. Qualitative assessment.**

Stage 3: Risk Qualitative assessment. Assessing the impact and likelihood of identified risks. Analyzing numerically the probability of each risk and its consequence on project objectives. Risk impact matrix: probability and impact. Calculating Risk Exposure. Problems of Measuring Risk.

**Topic 8. Qualitative/mathematical assessment and modeling.**

Application of methods for numerical analysis of cost and probability for the identified risks using special tools and software. When to perform quantitative assessment: drawbacks of quantitative assessment. Tools and methods of quantitative analysis. Scenario analysis, sensitivity analysis/tornado chart, Monte-Carlo simulation, Decision Tree framework.

**Topic 9. Risk management process: risk response and control.**

Stage 4: Risk response planning – how to translate the prioritized risk list into action plans with detailed definition of response strategy. Risk response plan structure. Contingency Planning Now or Emergency Relief Later. Risk response actions and Risk response strategy definition. General Risk Mitigation Strategies for Technical, Cost, and Schedule Risks (examples).

**Topic 10. Risks in IT outsourcing.**

What is IT outsourcing. IT outsourcing: statistics. Levels of IT outsourcing. Outsourcing trends and reasons of IT outsourcing. Global survey on Outsourcing drivers by Isaca. Key ingredients for successful IT outsourcing. Steps to help ensure successful execution of IT outsourcing. IT outsourcing agreements checklist.

**Topic 11. Risks and information security.**

Information security role in protecting the assets of an organization. ISO standards: information security. COBIT and information security. Main security characteristics: Confidentiality, integrity, availability. Key assets of information security, threats classification. Identification & Authentication controls. Information security risk management steps.

**Topic 12. Organization of risk management. Team management.**

IT and human factor, the specifics of IT project staffing. Organizational System: roles, norms, organizational culture. Recent trends affecting it people management. Human factors that will cause problems in implementation. How to prevent HR risks and project failure. Proper project team organization is one of the key constraints to project success. Risk manager role, other interested parties.

**Topic 13. IT Risk management Audit.**

Audit of information system: how to determine whether the IT system is maintaining data integrity and operating efficiently in order to meet the organization's goals. Classification of IT Audit. Scope of IT audit and objectives/ why we need IT audit? Audit process and explanation. Example of audit questionnaire to identify and avoid IT risks.

**Topic 14. Software Tools in risk management.**

System Selection Criteria, software development options. What to choose: packaged or custom IT solution? Localization of the information system. How to select a packaged software product. Request for Information Contents. Definition of requirements to software product. Risk management software vendors (leaders) and classification. Software risk management tools.

## V. Reading List

### Required:

- Avdoshin S., Pesotskaya E. Business informatization. Managing risks. Moscow: DMK Press, 2011 [in Russian] – for Russian speaking students.
- Software engineering. Sommerville I. Pearson, 2016
- Software risk management. Sergey M. Avdoshin ; Elena Y. Pesotskaya. 2011 7th Central and Eastern European Software Engineering Conference (CEE-SECR)
- Software risk management in practice: Shed light on your software product. Jens Knodel ; Matthias Naab ; Eric Bouwers ; Joost Visser 2015 IEEE 22nd International Conference on Software Analysis, Evolution, and Reengineering (SANER)
- Top-10 risks in real-client software engineering class projects. Supannika Koolmanojwong 2014 IEEE 27th Conference on Software Engineering Education and Training (CSEE&T)
- IEEE Draft Standard - Systems and Software Engineering - Life Cycle Processes - RiskManagement. IEEE P16085/CD, February 2018

### Optional:

- Управление информационной безопасностью: учебное пособие. Шилов А. К. Издательство: Издательство Южного федерального университета, 2018 [in Russian].
- Методические основы управления ИТ-проектами: учебник. Грекул В. И., Коровкина Н. Л., Куприянов Ю. В. Издательство: Интернет-Университет Информационных Технологий, 2010 [in Russian].
- Организация и технологии защиты информации : обнаружение и предотвращение информационных атак в автоматизированных системах предприятий: учебное пособие. Сердюк В. А. Издательство: Издательский дом Высшей школы экономики, 2015 [in Russian].
- Процессы анализа и управления рисками в области ИТ. Никитин И. А., Цулая М. Т. Издательство: Национальный Открытый Университет «ИНТУИТ», 2016 [in Russian].
- Управление программными проектами: учебник. Ехлаков Ю. П. Издательство: Томский государственный университет систем управления и радиоэлектроники, 2015 [in Russian].
- Менеджмент риска информационной безопасности: учебное пособие. Веселов Г. Е., Абрамов Е. С., Шилов А. К. Издательство: Издательство Южного федерального университета, 2016 [in Russian].
- Заглавие: Качество. Инновации. Образование: Организационные риски при внедрении корпоративных систем и приложений Автор: Авдошин С. М., Песоцкая Е. Ю. [in Russian].
- Информатизация бизнеса. Управление рисками : учебник для вузов Автор: Авдошин С. М., Песоцкая Е. Ю. Издательство: ДМК Пресс, 2011 [in Russian].
- Crisis management for software development and knowledge transfer. Zыkov S.V. Springer, 2016

- Six Sigma software development. Tayntor C. B. Auerbach Publications, 2007
- CMMI for outsourcing guidelines for software, systems and IT acquisition. Hofmann H. F. Addison-Wesley, 2007
- Risk management and simulation. Gupta A. CRC Press, 2014
- Total information risk management : maximizing the value of data and information assets. Borek A. Elsevier, 2014
- Managing software crisis: a smart way to enterprise agility. Zykov S.V. Springer. 2018
- Managing the unmanageable : rules, tools, and insights for managing software people and teams. Mantle M. W. Addison-Wesley, 2013
- Risk management system for ERP software project. Muhammad Zaman Fakhar ; Muhammad Abbas; Madiha Waris, 2013 Science and Information Conference
- Management of Complex Project Risks Based on Qualitative Assessments. V.N. Burkov ; I.V. Burkova ; K.E. Amelina ; Adamets D.Yu ; I.V. Goroshko, 2018 Eleventh International Conference "Management of large-scale system development" (MLSD)
- A Study of Software Development Project Risk Management. Ye Tao, 2008 International Seminar on Future Information Technology and Management Engineering, 2008
- Effectiveness research of quality management system on verification risk. Jianxin Huang ; Yaqin Bian. 2011 International Conference on Quality, Reliability, Risk, Maintenance, and Safety Engineering
- Murphy: A Web 2.0 approach for proactive risk management in hardware/software co-design Vladimir Blagojevic ; Wim Codenie ; Jessie Dedecker ; Nicolas Gonzalez-Deleito ; Jeroen Deleu; Nick Boucart, 2009 31st International Conference on Software Engineering - Companion Volume
- Analysis and Evaluation of Software Aggregative Risk Using Soft Computing Techniques. Kulbhushan Bansal ; Harish Mittal. 2014 Fourth International Conference on Advanced Computing & Communication Technologies
- Software risk management in practice: Shed light on your software product. Jens Knodel ; Matthias Naab ; Eric Bouwers ; Joost Visser. 2015 IEEE 22nd International Conference on Software Analysis, Evolution, and Reengineering (SANER)
- A risk assessment model for collaborative support in software management. Bokolo Anthony ; Noraini Che Pa ; Rozi Nor Haizan Nor ; Yusmadi Yah Josoh. 2015 9th Malaysian Software Engineering Conference (MySEC)
- A new approach for software risk estimation. Rabindra Bista ; Sushama Karki ; Deeyoranjan Dongol. 2017 11th International Conference on Software, Knowledge, Information Management and Applications (SKIMA)
- Intelligent Software Platform and End-Point Software for Risk Management. A. Senkov. 2018 International Multi-Conference on Industrial Engineering and Modern Technologies (FarEastCon)
- The Risks of Agile Software Development: Learning from Adopters. Amany Elbanna ; Suprateek Sarker IEEE Software Volume: 33, Issue: 5, 2016
- Agility, Risk, and Uncertainty, Part 2: How Risk Impacts Agile Architecture Michael Waterman, IEEE Software Volume: 35, Issue: 3 , 2018



- Defining Technical Risks in Software Development. Vard Antinyan ; Miroslaw Staron ; Wilhelm Meding ; Anders Henriksson ; Jörgen Hansson ; Anna Sandberg, 2014 Joint Conference of the International Workshop on Software Measurement and the International Conference on Software Process and Product Measurement
- A Critical Analysis of Software Risk Management Techniques in Large Scale Systems, Maruf Pasha ; Ghazia Qaiser ; Urooj Pasha, IEEE Volume: 6, 2018
- Top twenty risks in software projects: A content analysis and Delphi study. Pontakorn Sonchan ; Sakgasit Ramingwong, 2014 11th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON)
- Sensitivity analysis of software project risk assessment model. Chi Zhou ; Yingchun Wang ; Huixia Huang. 2016 IEEE Advanced Information Management, Communicates, Electronic and Automation Control Conference (IMCEC)
- ARMI 2.0: An online risk management simulation. Pontakorn Sonchan ; Sakgasit Ramingwong. 2015 12th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology (ECTI-CON)
- Identifying risks of software project management in Global Software Development: An integrative framework. Saad Yasser Chadli ; Ali Idri ; José Luis Fernández-Alemán ; Joaquín Nicolás Ros ; Ambrosio Toval. 2016 IEEE/ACS 13th International Conference of Computer Systems and Applications (AICCSA)
- Intelligent Software Platform and End-Point Software for Risk Management. A. Senkov. 2018 International Multi-Conference on Industrial Engineering and Modern Technologies (FarEastCon)
- Agile Software Risk Management Architecture for IoT-Fog based systems. P. Gouthaman ; Suresh Sankaranarayanan. 2018 International Conference on Smart Systems and Inventive Technology (ICSSIT)
- Software Reliability Evaluation Method Based on a Software Network. Jun Ai ; Wenzhu Su ; Fei Wang, 2018 IEEE International Symposium on Software Reliability Engineering Workshops (ISSREW)
- A Software System for Risk Management of Information Systems. Askar Boranbayev ; Seilkhan Boranbayev ; Assel Nurusheva ; Kuanysh Yersakhanov ; Yerzhan Seitkulov. 2018 IEEE 12th International Conference on Application of Information and Communication Technologies (AICT)
- Risk Management for High Tech Systems. Marielle Stoelinga. 2018 IEEE/ACM 6th International FME Workshop on Formal Methods in Software Engineering (FormaliSE)
- A Dataset for Software Requirements Risk Prediction. Zain Shaukat Shaukat ; Rashid Naseem ; Muhammad Zubair. 2018 IEEE International Conference on Computational Science and Engineering (CSE)
- Collaborative security risk estimation in agile software development. Inger Anne Tøndel, Martin Gilje Jaatun, Daniela Soares Cruzes and Laurie Williams, 2014
- Управление информационной безопасностью: учебное пособие. Шилов А. К. Издательство: Издательство Южного федерального университета, 2018 [in Russian].

**Optional online resources:**

<https://ru.coursera.org/lecture/business-analytics-decision-making/0-risk-analysis-and-monte-carlo-simulation-z4GH5>

<https://ru.coursera.org/lecture/wharton-quantitative-modeling/3-5-monte-carlo-simulations-MMEtB>

<https://ru.coursera.org/lecture/probability-statistics/6-5-monte-carlo-simulation-99ppf>

<https://ru.coursera.org/learn/wharton-risk-models>

## VI. Grading System

- [A] MT- end-of-1<sup>st</sup> module control point which controls the execution of the case-study given during 1st module.
- [B] Home assignment (HA) based on 12 home tasks (in accordance to lecture material)
- [C] concluding check: final exam (E) at the end of 2nd module (the last module of the course).

Work activity during seminar hours in 1st, 2nd modules to be controlled by the use of keeping students attendance records and scoring (evaluation) involvement into discussions as well as quality of exercise performance during seminars.

Conversion of the concluding rounded grade (FE) to five-point scale grade is done in accordance with the following table:

**Summary Table: Correspondence of ten-point to five-point system's marks**

<b>Ten-point scale [10]</b>	<b>Five-point scale [5]</b>
1 - unsatisfactory 2 - very bad 3 – bad	Unsatisfactory- 2
4 – satisfactory 5 - quite satisfactory	Satisfactory- 3
6 - good 7 - very good	Good - 4
8 - nearly excellent 9 - excellent 10 – brilliantly	Excellent- 5

## VII. Examination Type

Ultimate grades of the concluding check (FE) on ten-point scale are obtained as follows:

$$FE = 0.2*MT + 0,2*HA + 0.6*E,$$

As always, calculated value of FE is rounded to integer grade, considering work activities (WA) during seminar lessons.

end-of-module control point (MT, end of first module) and final examination (FE) given in the second module. During the 1st and second module students are working on the home assignment (business-case) to be checked at the end of the first and second module (before the exam).

## **VIII. Methods of Instruction**

### *1. Home assignment.*

Home assignment is made as a paper report based on the case study assignment. Case study describes the real IT software development project and suggest to apply various tools and techniques of risk management for the each stage of life cycle. In the report students should demonstrate their knowledge on the following practical areas and be able to:

- Develop own risk classification based on selected criteria, considering risk causes and risk factors
- Identify risks for the given situation with different methods and structure identified risks in a risk register form
- Define risk probability and risk impact, calculate risk exposure and rank risks according to their priorities
- Perform quantitative risk analysis by using Decision Tree technique and calculating Estimated Monetary Value (EMV)
- Get familiar with different response actions, choose the appropriate action and define preventive and corrective actions
- Create risk reporting documentation with accordance to team needs
- Get used to communication channels and means, identify main participants of project communications, create communication plan and define organizational risks
- Distinguish technical, functional and general requirements for the Risk management software/product, understand who is the owner of the requirement
- Conduct IT audit, develop questionnaire for current status analysis and risk assessment

### *1. Class activities and preparation for the test includes study of the following topics:*

- Risk management fundamentals. Specifics of IT industry and projects
- Overview of the main standards and methodologies on RM: MSF, RUP, XP, PMBoK
- Key success factors and problem areas in IT
- Key risk factors: quality improvement and requirements tracking
- Risk Taxonomy/classification. Risk factors
- Risk management process: identification
- Risk management process: qualitative assessment
- Risk management process: quantitative assessment and modeling
- Risk management process: risk response and control
- Risks in IT outsourcing

- Risks and information security
- Organization of risk management. Team management
- IT Risk management audit
- Software tools in risk management

2. *Preliminary questions for the test / exam:*

- What is the place and role of risk management in software engineering development process
- What are definitions of risk?
- What are the major problems that face software engineers while developing and maintaining IT projects?
- Why it is important to manage risks across the software development and maintenance life cycle.
- Describe the main risk management standards and methodologies by category (general / management / software)
- What are the general risks, typical for each life cycle during software development and IT project?
- What are the main entities for software risk classification? What are the specifics of IT risk classification and its difference from other risk clarifications?
- What are the core stages of the risk management process?
- What are the basic tools and techniques applicable for risk identification? How to choose the appropriate tool?
- What is the prioritization procedure in risk management looks like? How to range a list of risks?
- How to create a risk management plan? What is the structure and contents?
- What are the interactions between software development team with risk management processes in place?
- What are the specifics of IT risks? Why software projects are often failure?
- Describe the main risk identification techniques: e.g. brainstorming, fishbone, Delphi, SWOT analysis, Crawford cards, etc.
- Describe the techniques for risk assessment: scenario analysis, Decision Tree analysis, modeling techniques such as Monte-Carlo simulation, etc.
- Describe the responsibility and accountability of risk management activities in IT operations
- Clarify the business value that can be realized by creating a risk management culture?
- What are the main tools and techniques for risk assessment process? How to choose the appropriate tool?
- What are the main risks of information security?
- What are the main risk response actions? What is the difference?

- Are there any software packages and programs available in the software market to automate some of risk management processes? What can be automated?

## **IX. Special Equipment and Software Support (if required)**

#	Type	Access
1.	Microsoft Windows 7 Professional RUS Microsoft Windows 10 Microsoft Windows 8.1 Professional RUS	<i>Internal HSE network</i>
2.	Microsoft Office Professional Plus 2010	<i>Internal HSE network</i>

Classrooms for lectures on the discipline are equipped accordingly for the use and demonstration of thematic illustrations corresponding to the program of the discipline, consisting of:

- PC with Internet access (operating system, office programs, anti-virus programs);
- Multimedia projector with remote control.

Training rooms for self studies of the discipline are equipped with PC with Internet access, with the ability to connect to the Internet and access to the electronic educational environment of HSE.